



United States
Department of
Agriculture

Agricultural
Marketing
Service

Fruit and
Vegetable
Programs

Processed
Products
Branch

Draft II

Proposed United States Standards for Grades of Frozen Onions

Effective Month Year

Proposed

This is the first issue of the United States Standards for Grades of Frozen Onions, to become effective _____.

Voluntary U.S. grade standards are issued under the authority of the Agricultural Marketing Act of 1946, which provides for the development of official U.S. grades to designate different levels of quality. These grade standards are available for use by producers, suppliers, buyers, and consumers. As in the case of other standards for grades of processed fruits and vegetables, these standards are designed to facilitate orderly marketing by providing a convenient basis for buying and selling, for establishing quality control programs, and for determining loan values.

The standards also serve as a basis for the inspection and grading of commodities by the Federal inspection service, the only activity authorized to approve the designation of U.S. grades as referenced in the standards, as provided under the Agricultural Marketing Act of 1946. This service, available as on-line (in-plant) or lot inspection and grading of all processed fruit and vegetable products, is offered to interested parties, upon application, on a fee-for-service basis. The verification of some specific recommendations, requirements, or tolerances contained in the standards can be accomplished only by the use of on-line inspection procedures. In all instances, a grade can be assigned based on final product factors or characteristics.

In addition to the U.S. grade standards, grading manuals or instructions for inspection of several processed fruits and vegetables are available upon request for a nominal fee. These manuals or instructions contain detailed interpretations of the grade standards and provide step-by-step procedures for grading the product.

Grade standards are issued by the Department after careful consideration of all data and views submitted, and the Department welcomes suggestions which might aid in improving the standards in future revisions. Comments may be submitted to, and copies of standards and grading manuals obtained from:

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United States Standards for Grades of Frozen Onions

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Authority: Agricultural Marketing Act of 1946, Sects. 203, 205, 60 Stat. 1087, as amended, 1090, as amended (7 U.S.C. 1622, 1627)

Note: Compliance with the provisions of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act, or with applicable State laws and regulations.

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**THIS PROPOSED GRADE STANDARD IS FOR DISCUSSION PURPOSES ONLY AND
HAS NOT BEEN APPROVED BY THE U.S. DEPARTMENT OF AGRICULTURE**

Proposed

52.4072 Product description.

Frozen onions are the frozen product prepared from fresh, clean, sound, firm bulbs of the common commercial varieties of onions, *Allium cepa*, which have been properly prepared, blanched or unblanched and are then frozen in accordance with good commercial practice and maintained at temperatures necessary for the preservation of the product.

52.4073 Styles.

- (a) **Whole** means whole stemmed, peeled bulbs of the sizes listed below:
 - (1) **Type I** - Whole Onions (Boilers/ Creamers) are 1-1/4 (30mm) to 1-7/8 inch (48 mm) in diameter in the greatest dimension of the onion at right angles to a line running from the stem to the root.
 - (2) **Type II** - Pearl Onions are 3/4 inch (18 mm) to 1-1/4 inch (30 mm) in diameter in the greatest dimension of the onion at right angles to a line running from the stem to the root.
- (b) **Strips** means stemmed, peeled bulbs which have been cut lengthwise into long narrow pieces of uniform width. This style may be further identified by the sizes designated below:
 - Small**- maximum of 1/4 inch (6 mm) in width.
 - Medium**- Greater than 1/4 inch (6 mm) but less than 3/4 inch in width.
 - Large**- Greater than 3/4 inch (19 mm) but less than 1 inch (25 mm) in width.
- (c) **Diced** means stemmed, peeled bulbs which have been uniformly cut into square pieces up to one inch (25 mm) in width determined by the width or cross-section of the unit in the greatest dimension. This style may be further identified by the sizes designated below:
 - Small**- maximum of 1/4 inch (6 mm).
 - Medium**- Greater than 1/4 inch (6 mm), but less than 3/4 inch (19 mm).
 - Large**- Greater than 3/4 inch (19 mm), but less than 1 inch (25 mm).
- (d) **Cut** means frozen onions which are cut and do not conform to any of the foregoing styles.
- (e) **Other** means any other frozen onion product may be designated as to style by description of the size, shape, or other characteristic which differentiates it from other styles.

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52.4074 Requirements for style.

- (a) **Whole.**
 - (1) **Regular style (Type I).** The units are well shaped and that approximately 10 percent by count of the units (lot average) may be less than 1-1/4 inch (32 mm), or greater than 1-7/8 inches (48 mm) at the widest portion of the unit.
 - (2) **Pearl Onions (Type II).** The units are well shaped and that approximately 10 percent by count of the units (lot average) may be less than 3/4 inch (19 mm), or greater than 1-1/4 inch (32 mm) in the greatest portion of the unit.
- (b) **Strips style.** A minimum of 80%, by weight, of units shall meet the style description. If a size is designated, a minimum of 70% , by weight of the units should meet the size designation.
- (c) **Diced style.** A maximum of 20%, by weight, of diced units, exceed 1 inch (25 mm), and a maximum of 10%, by weight, of diced units are less than 1/8 inch (3 mm) in the greatest dimension across the unit are allowed, provided that very small pieces do not materially affect the appearance of product. If a size is designated, a minimum of 70% , by weight of the units should meet the size designation.
- (d) **Cut.** Units may vary considerably in size and shape provided that the overall appearance is not materially affected.
- (e) **Other.** Units may be reasonably uniform in size and shape provided that the overall appearance is not materially affected.

52.4075 Definitions of terms.

- (a) **Acceptable quality level (AQL)** means the maximum percent of defective units or the maximum number of defects per hundred units of product that, for the purpose of acceptance sampling, can be considered satisfactory as a process average.
- (b) **Appearance.**
 - (1) **Good appearance** means that markedly variable units, small specks or other factors, do not more than slightly affect the overall appearance or edibility of the onion.
 - (2) **Reasonably good** appearance means that the overall appearance or edibility of the onion is slightly but not seriously affected by markedly variable units, small specks or other factors.

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- (c) **Basal plate** means the bottom portion of the onion where the roots attach to the onion bulb. The basal plate must exceed 3/8 inch (10mm) in diameter to be considered a defect. Basal plate is considered a defect under “Core Material”. One unit is equivalent to one defect.
- (d) **Blemished** means the unit is affected or damaged by pathological injury, insect injury, or any other injury except for mechanical injury, which singly or in combination, affects the appearance or eating quality of the unit. Internal sprouts that show no discoloration are not considered as being blemished.
 - (1) **Minor blemish** means a unit with tan to brown blemish(s), which in the aggregate, exceeds the area of a circle 2 mm (0.19 in) in diameter but not more than 6 mm (0.25 in) in diameter.
 - (2) **Major blemish** means a unit with a tan to dark blemish(s), which in the aggregate, exceeds the area of a circle 6 mm (0.25 in) in diameter.
 - (3) **Decay** means the bacterial or fungal deterioration of a unit to the extent that the appearance or eating quality is seriously affected or to a degree that the unit is offensive. This is a critical defect.
- (e) **Character** means the extent of firmness and compactness of the onion unit and its degree of freedom from slime, and soft, mushy units.
- (f) **Color** refers to the predominating and characteristic color of the exterior surface of the units of frozen onions.
 - (1) **Good color** means that over 90 percent by weight of the frozen onions have a good characteristic bright white to creamy white color which may include greenish areas and/or stripes on the surface of the units that is typical for the variety and with respect to Type I and Type II, variations in color do not materially affect the appearance of the product. The color of Grade "A" frozen onions is not significantly affected by oxidation, dull grayish-white cast, or other discoloration, such as a yellowish, or dull brownish cast.
 - (2) **Reasonably good color** means that over 75 percent by weight of the individual units have a reasonably bright characteristic color which may include greenish areas and/or stripes that are typical for the variety and with respect to Type I and Type II and that variations in color do not seriously affect the appearance of the product. The product is not seriously affected by oxidation, dull grayish-white casts, or other discoloration, such as a yellowish or dull brownish cast.

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- (3) **Poor color** means the units fail the definition of reasonably good color.
- (g) **Core material** means the fibrous portions of the onion bulb. This portion is part of the onion flesh and should not be discolored, excessively tough, fibrous, or soft and mushy. Core material may include sprouts, basal plates exceeding 3/8 inch (10 mm) in diameter, or seed stems. One unit is equivalent to one defect.
- (h) **Defect** means any nonconformance of a unit(s) of product from a specified requirement of a single quality characteristic.
- (i) **Extraneous vegetable material (EVM)** means any plant material of onions or other plants including but not limited to the leaves or roots (aggregate of one inch in length or more).
- (j) **Loose scales** (in Whole style only) means whole or partial onion layers that have become detached from the onion.
- (k) **Mechanical damage** means that the appearance of the unit is affected by gouging, or the unit is crushed, or broken to the extent that the appearance is materially affected.
- (l) **Normal flavor and odor** means that the onion, before and after cooking, has a flavor and odor that is normal and typical for the variety and is free from objectionable flavors and odors, grit or dirt.
- (m) **Peel** means the thin outer skin of the bulb. Peel is usually creamy, white to brown in color, tough, and tissue-like. One defect is equivalent to 1/2 square inch (3.2 cm²).
- (n) **Poorly trimmed** units (in Whole style only) means units where the outer skin around the neck or top end of the onion extends more than 3/8 inch (10 mm) from the or neck of the onion bulb.
- (o) **Sprouts** means the internal material that protrudes from the top or neck of the onion. Scorable sprouts may be tough, fibrous, or leathery and may be white, brown to tan, or green in color and should not extend more than 1/4 inch (7 mm) from the neck of the onion. One unit is equivalent to one defect under “Core Material”.

Proposed

- (p) **Sample size** means the amount of product specified to use for grading. For varietal characteristics, color, flavor and odor, and appearance, a sample size is the entire container. For blemishes, character, specified defects, mechanical damage, and loose scales, a sample size is 50 units by count for Whole style, or 450 grams (1 pound) by weight for strips, diced, cut and other styles. It may be:
 - (1) The entire contents of a container;
 - (2) A portion of the contents of a container; or
 - (3) A combination of the contents of two or more containers.
- (q) **Tolerance (TOL)** means the percentage of defective units allowed for each quality factor for a specific sample size.
- (r) **Unit** means a whole peeled bulb, immature bulb, individual piece, or portion of such, in frozen onions.

52.4076

Grades.

- (a) **U.S. Grade A** is the quality of frozen onions that meets the following prerequisites in which the onions:
 - (1) Have similar varietal characteristics,
 - (2) Have a normal flavor and odor,
 - (3) Have a good color; and
 - (4) Are within the limits for defects as specified in Tables I and II of this subpart, as applicable for the style in Section 52.4073.
- (b) **U.S. Grade B** is the quality of frozen onions that meets the following prerequisites in which the onions:
 - (1) Have similar varietal characteristics;
 - (2) Have a normal flavor and odor;
 - (3) Have a reasonably good color; and
 - (4) Are within the limits for defects as specified in Tables I and II of this subpart as applicable for the style in Section 52.4073.
- (c) **Substandard** is the quality of frozen onions that fail to meet the requirements of U.S. Grade B.

Proposed

52.4077 Factors of quality.

The grade of frozen onions is based on meeting the requirements for the following factors:

- (a)** Prerequisites;
 - (1)** Varietal characteristics;
 - (2)** Color;
 - (3)** Flavor and odor; and
 - (4)** Appearance;
- (b)** Classified Quality Factors and Defects; 1/
 - (1)** Poorly colored units or units with poor color;
 - (2)** Decay (Critical Defect);
 - (3)** Major blemishes;
 - (4)** Minor blemishes;
 - (5)** Total blemishes (Critical, Major, and Minor);
 - (6)** Character;
 - (7)** Mechanical Damage;
 - (8)** Core Material;
 - (a)** Basal plate material exceeding 3/8 inch (9.5 mm) in diameter,
 - (b)** Seed stem,
 - (c)** Sprouts exceeding 1/4 inch (7 mm) in length from the neck of the onion.
 - (9)** EVM;
 - (a)** Leaves,
 - (b)** Loose roots aggregate of 1 inch in length or greater.

/1 All defect tolerances for are based on grams except for Core Material, EVM, and Peel in styles other than Whole.

Proposed

- (9) Peel;
- (10) Poorly trimmed units (In Whole Style Only);
- (11) Loose scales (In Whole Style Only).

52.4078 Requirements for classified quality factors and defects.

- (a) **Sample size** can be found in Section 52.4075 (n), Definition of Terms.
- (b) **Acceptance criteria** for specified defects can be found in Tables I and II, that follow:

Proposed

TABLE I
AQL's AND TOLERANCES (TOL.) FOR DEFECTS IN WHOLE STYLE
BASED ON 50 UNITS OF PRODUCT FOR 13 SAMPLE UNITS, 50x13 = 650 UNITS

Sample Units x Sample unit Size			1 x 50	3 x 50	6 x 50	13 x 50	21 x 50	29 x 50
Units of Product			50	150	300	650	1050	1450
Defects	AQL	TOL						
GRADE A			ACCEPTANCE NUMBERS					
Poor Color	3.8	5	4	9	17	33	50	67
Decay (Critical Defect)	0.612	1	1	2	4	7	10	14
Major Blemished	1.3	2	2	4	7	13	20	26
Total Blemished (Critical, Major, Minor)	3.8	5	4	9	17	33	50	67
Poor Character	1.3	2	2	4	7	13	20	26
Poorly Trimmed Units	1.3	2	2	4	7	13	20	26
Mechanical Damage	1.3	2	2	4	7	13	20	26
Core Material	1.3	2	2	4	7	13	20	26
* Peel (sq. in.)	1.3	2	2	4	7	13	20	26
Loose scales	2.9	3	3	8	13	26	39	14
EVM	0.612	1	1	2	4	7	10	14

* 1/2 square inch = one defect

Proposed

TABLE I (Continued)
AQL's AND TOLERANCES (TOL.) FOR DEFECTS IN WHOLE STYLE

Sample Units x Sample unit Size			1x50	3x50	6x50	13x50	21x50	29x50
Units of Product			50	150	300	650	1050	1450
Defects	AQL	TOL						
GRADE B			ACCEPTANCE NUMBERS					
Poor Color	6.4	8	6	15	26	52	80	108
Decay	1.3	2	2	4	7	13	20	26
Major Blemish	2.9	3	3	8	13	26	39	53
Total Blemished (Critical, Major & Minor)	6.4	8	6	15	26	52	80	108
Poor Character	2.9	3	3	8	13	26	39	53
Poorly Trimmed	2.9	3	3	8	13	26	39	53
Mechanical Damage	2.9	3	3	8	13	26	39	53
Core Material	2.9	3	3	8	13	26	39	53
* Peel (sq.in.)	2.9	3	3	8	13	26	39	53
Loose scales	3.8	4	4	9	17	33	50	67
EVM	1.3	2	2	4	7	13	20	26

* 1/2 square inch = one defect

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TABLE II
AQL'S AND TOLERANCES (TOL.) FOR DEFECTS IN STRIPS, CUT, DICED, AND OTHER
STYLES BASED ON 450 GRAMS OF PRODUCT FOR 13 SAMPLE UNITS, 450X13 =5850GRAMS

Sample Units x Sample unit Size			1 x 450	3 x 450	6 x 450	13 x 450	21 x 450	29 x 450
Units of Product			450	1350	2700	5850	9450	13050
Defects	AQL	TOL						
GRADE A			ACCEPTANCE NUMBERS					
Poor Color (Grams)	4.5	5	27	73	139	290	459	627
Decay (Grams) (Critical Defect)	0.8	1	7	16	30	59	91	123
Major Blemish (Grams)	1.72	2	12	31	57	109	183	249
Total Blemished (Critical, Major, Minor) (Grams)	4.5	5	27	73	139	290	459	627
Poor Character	1.72	2	12	31	57	109	183	249
Mechanical Damage	3.6	4	23	60	113	234	370	506
**Core Material (units)	0.056	0.1	1	2	3	6	9	12
**EVM (units)	0.056	0.1	1	2	3	6	9	12
*Peel (sq. in.)	0.056	0.1	1	2	3	6	9	12

* 1/2 square inch = one defect

** All Defect tolerances are based on grams except for Core Material, EVM and Peel which are on a per unit basis.

Proposed

TABLE II, CONTINUED
AQL'S AND TOLERANCES (TOL.) FOR DEFECTS IN STRIPS, CUT, DICED, AND OTHER
STYLES BASED ON 450 GRAMS OF PRODUCT FOR 13 SAMPLE UNITS, 450X13 =5850GRAMS

Sample Units x Sample unit Size			1 x 450	3x 450	6 x 450	13 x 450	21 x 450	29 x 450
Units of Product (Grams)			450	1350	2700	5850	9450	13050
Defects	AQL	TOL						
GRADE B			ACCEPTANCE NUMBERS					
Poor Color (Grams)	9.3	10	52	144	277	583	928	1017
Decay (Critical Defect)(Grams)	1.72	2	12	57	83	117	183	249
Major Blemish (Grams)	3.6	4	23	60	113	234	370	506
Total Blemishes (Critical, Major, &Minor)(Grams)	9.3	10	52	144	277	583	928	1271
Poor Character	3.6	4	23	60	113	234	370	506
Mechanical Damage	7.4	8	43	116	223	467	743	1017
**Core Material (units)	0.131	0.2	2	4	6	12	18	24
**EVM (units)	0.131	0.2	2	4	6	12	18	24
* Peel (sq. in.)(units)	0.131	0.2	2	4	6	12	18	24

* 1/2 square inch = one defect

** All Defect tolerances are based on grams except for Core Material, EVM and Peel which are on a per unit basis.

Proposed

52.4079 Sample size.

The sample size used to determine whether the requirements of these standards are met shall be as specified in the sampling plans and procedures in the "Regulations Governing Inspection and Certification of Processed Fruits and Vegetables, Processed Products Thereof, and Certain Other Processed Products" (7 CFR 52.1 through 52.83).

52.4080 Acceptance criteria.

- (a) **Style.** A lot of frozen onion is considered as meeting the requirements for style if the requirements in Section 52.4074 as applicable are not exceeded.
- (b) **Quality Factors.** A lot of frozen onions is considered as meeting the requirements for quality if:
 - (1) The prerequisites specified in Section 52.4075 are met; and
 - (2) The Acceptance Numbers in Table I or II, as applicable, are not exceeded.
- (c) **Single Sample Unit.** Each unofficial sample unit submitted for quality evaluation will be treated individually and is considered as meeting requirements for quality and style if:
 - (1) The prerequisites specified in Section 52.4077 are met; and
 - (2) The requirements for style in Section 52.4074 and the Acceptable Quality Levels (AQL's) in Tables I and II, in Section 52.2078, as applicable, are not exceeded.